

Milliwatt Radioisotope Stirling Convertor, Phase I

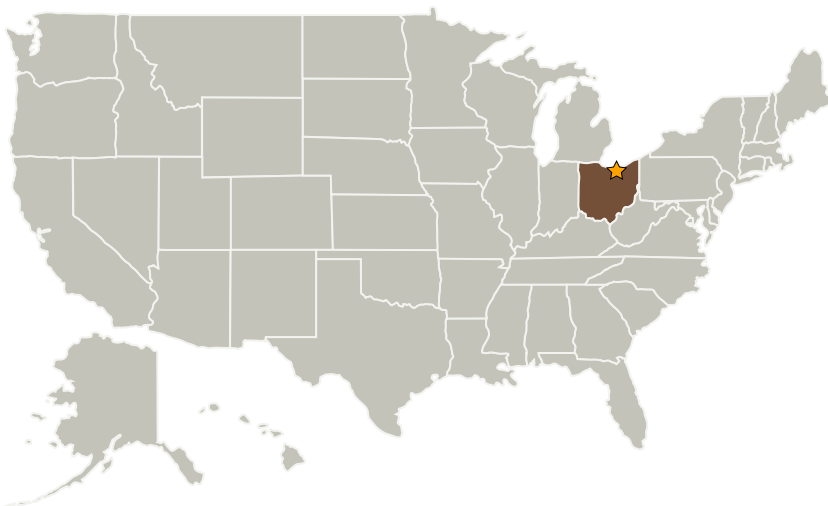
Completed Technology Project (2005 - 2005)



Project Introduction

Sest, Inc. proposes to perform a detailed evaluation at the both convertor and component levels of a small, low electrical output power (50 to 500 mW) Stirling cycle based convertor utilizing light weight radioisotope heater units (LWRHU) as the heat source. The proposed milliwatt radioisotope Stirling convertor (MRSC) will be optimized for output power with source temperatures in the range of 480 to 560 oK so as to provide electric power at convertor efficiencies in the range of 15 to 20% and sized to make maximum use of the existing LWRHU heat source. These efficiency levels are on the order of 2 to 4 times those of thermoelectric conversion systems. The evaluation processes will incorporate an in-depth evaluation of the structural materials and fabrications techniques required to maximize convertor specific power while at the same time insuring high reliability and long operating life. Due to the unique operating characteristics of convertors of this size a proof of concept linear alternator will be developed and tested during Phase I. At the completion of the proposed Phase I effort a specific final configuration for the detailed hardware design and fabrication in the Phase II effort will be fully defined. In addition a scaling study will be performed identify optimal configurations over the entire power range of interest.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Glenn Research Center (GRC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★ Glenn Research Center(GRC)	Lead Organization	NASA Center	Cleveland, Ohio
Sest, Inc.	Supporting Organization	Industry	Middleburg Heights, Ohio

Primary U.S. Work Locations

Ohio

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

L. Barry Penswick

Technology Areas

Primary:

- TX03 Aerospace Power and Energy Storage
 - └ TX03.1 Power Generation and Energy Conversion
 - └ TX03.1.4 Dynamic Energy Conversion